Understanding Traditional Knowledge for Ecological Restoration: A Qualitative Study with the Eastern Band of Cherokee and Southern Appalachian Community Members

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Introduction

The use of traditional ecological knowledge (TEK) of fire has been debated since the mid sixteenth century (Goodwin 1977) when non-Native American people viewed Indians as not being civilized enough to know the uses and effects of fire. This view brought about the belief that the Indians could not have had any significant influence on the environment (Kretch III 1999). The arrival of European explorers and settlers brought on a number of changes for the Indians and the land they occupied. Indians have brought on a number of changes for the Indians and the land they occupied. Indians have used fire to clear land for agriculture, improve visibility for hunting and traveling, and reduce the accumulation of fuels to prevent catastrophic wildfires (Noss 1983). Particularly in the Southern Appalachians Native Americans have been burning for agricultural and hunting purposes for 10,000 years (Keel 1976 in Van Lear and Waldrop 1989). Instead of acting as a destructive force, the Indians were acting as a functioning component of the ecosystem (Goodwin 1977). As a functioning component in the ecosystem, Native Americans were intentionally burning and cutting trees down because they knew burning and cutting created specific effects. For example, Goodwin describes how Indians burned forests to prevent uncontrolled fires, to clear heavy fuel loads, and undesirable weeds for cultivation. He goes on to discuss how Indians burned longleaf pine (*Pinus palustrus*) forests to eliminate brown-spot needle disease and competitive

vegetation. Goodwin describes the importance of longleaf pine to build shelter, build canoes, and for firewood.

Before the arrival of European explorers, the Cherokee and other Native American tribes occupied present-day North Carolina, Tennessee, and Georgia (Hudson 1976). The Indians utilized local varieties of wood such as white oak, pine trees, and hickory to build their homes, weave baskets, for firewood, and to make weapons (Hamel and Chiltoskey 1975). The Cherokee knew resources gathered from the forest had to be sustained to ensure adequate materials for future use. People intentionally modified the environment to produce resources that they needed to survive. The ecosystem and landscape modifications greatly influenced present conditions of Southeastern forests. European contact brought new leadership and lifestyles, which in turn influenced how Cherokee managed their land (Ehle 1988).

There is also a lack of consensus among scientists and land managers about the extent of Native American burning because available evidence is "scattered 17th and 18th century descriptions of forests and Indian activities" (Russell 1983, p 78). One article implied that the Cherokee of the Southeast could not have had any significant use for fire except for cooking because of the lack of direct evidence. In the "Ecological Indian," Shepard Kretch (1999) illustrated how people in the nineteenth century viewed Native Americans as "technologically incompetent" to even know the effects and outcomes of fire. Kretch also cited the United States Department of Agriculture (USDA) in the 1940s, stating that there is absolutely no proof that "Indians regularly set" fires because they "lacked matches." Finally, Kretch cited forest ecologists that claimed fire to be destructive and "made every effort to halt them in national forests and parks" (p 102).

On the other hand there are several articles that describe how Native Americans used fire to improve subsistence and economy. Gordon Day (1953) cited numerous texts that imply Native Americans of North America used fire for significant reasons. Burning was used to improve visibility, facilitate travel, increase supply of plant species, and reduce fuel accumulation. Day refers to Maxwell (1910) and Swanton (1928) who stated that fire was a common practice in the southeast. In comparison, Stephen Pyne (1983) reiterated Day's reasons for Native American use of fire in maintaining that Native Americans were dependent on fire for their economies. Gary Goodwin (1977) states fire was a "tremendous economic advantage (p 64)" to Cherokee lifestyle. Fire was used to communicate through smoke signals, fell trees, shape canoes, drive off mosquitoes/flies, and reduce the buildup of fuel (Pyne 1983). Native Americans continue to use different types of shrubs and trees to produce desired basket, weapon, and housing materials.

Currently, there are over 4,000 plant species in the Great Smoky Mountains National Park (Molloy 2001) that were fire adapted. Until the arrival of European settlers, many plant species in the forests were adapted to frequent human-nature interaction. Mark Harmon (1982) discussed how European settlers may have continued the process of burning that was "initiated by the Indians" (p 78). People mimicked the disturbances to create specific effects on the land and plants (Goodwin 1977). As in other regions of the continent, Southeastern forests have been subject to many environmental changes including fire suppression since European settlement (Day 1953). The United States Army field notebooks contain land survey and reconnaissance records of the Cherokee Nation in the mid 1800's. The land records show that the "woods were

not very thick and mostly pines" and the land is "covered with oak, hickory, chestnut & pines of young and medium growth (volume 3 and 4).

The primary objective of the research project, Understanding Traditional Knowledge for Ecological Restoration: A Qualitative Interview Study with Cherokee and Southern Appalachian Community Members, in North Carolina was to gather data concerning historical land management practices exemplified by traditional ecological knowledge and practices of the Cherokee Nation, specifically burning. This particular research project was established due to a collaborative effort between the Ecological Restoration Institute (ERI) at Northern Arizona University (NAU) and Coweeta Hydrological Laboratory in Otto, North Carolina. The study was designed to collect information about the fire history of the Southeast focusing on the region historically and currently occupied by the Eastern Band of Cherokee Indians (E.B.C.I) within a two year time frame. A research proposal requesting permission to conduct a research project with the Cherokee Tribe was submitted to the Cherokee Tribal Council, Cherokee Cultural Resource Center, and Cherokee Principal Chief, Leon Jones.

Methods

As research assistants Lisa Dunlop and I acted as the primary investigators (PI) during the duration of the study. The research project included two types of data sources; written records and qualitative interviews. We reviewed historical, ecological, and anthropological documents of the Southeastern region through Internet searches using specific terminologies such as "Cherokee" and "fire." We acquired current and historic literature from the microfiches/films and government documents from Hunter Library at Western North Carolina University (WNCU) and the University of Georgia (UG) library.

Documents unavailable at local libraries were obtained through inter-library loan. Books written on the historic and contemporary culture of the Cherokee tribe in the Southeast were purchased. We looked through historical documents in the archive section of the Cherokee Museum. Then we consulted local anthropologists and fire technicians who were recommended by Jim Vose and Katherine Elliott (researchers at Coweeta Hydrologic Laboratory). We spoke with the anthropologists about research projects they were conducting or had conducted concerning historic Cherokee habitat for information about the results they obtained. We conferred with fire technicians from local ranger districts for the region's fire records/plans and public land records. Both anthropologists and fire technicians were informed of the purpose of the study and the documents that were needed.

The qualitative interview process began with a network of people Lisa and I contacted through the Cherokee Artist Directory (Duncan et al. 2001) that the Cherokee Museum provided. Once the people were contacted by telephone, others in the local communities of western North Carolina, eastern Tennessee, and northern Georgia whose family tradition or research provided information about historic land management practices in the region were contacted. Participants were volunteers from the following pools:

1. Cherokee elders, tribal members, land managers, and museum employee
2. Forest Service or other federal, state and local administrators in land management agencies.
3. Appalachian community members with family histories in the region

4. Researchers from area universities who have been studying land management practices in the southeastern region.

The research project required approval from the Institutional Review Board (IRB) because the project involved gathering information from human subjects. The IRB served as a medium to ensure ethical and safe treatment of human subjects involved in the study. This qualitative study has been granted approval to conduct a study on "Understanding Traditional Knowledge for Ecological Restoration: A Qualitative Interview Study with Cherokee and Southern Appalachian Community Members."

The qualitative research design relied entirely on the interviews with individuals in a variety of communities, including those previously listed. The purpose of the interviews was to discover information pertaining to current and historic land management practices, with a specific focus on fire. A phenomenological interview, or a series of broad, open-ended questions, was presented to the interviewees for guidance for the duration of the interview. Each participant provided demographic information such as age, time in the community, and work or occupation. Then the participant was invited to respond to questions. Sample questions might go as follows: "Tell us about that time when you were learning about the importance of specific land practices or about the history of land management in this area. Tell us how you came across this information."

We began initiation of this procedure by first describing the intent and purpose of the interview, which was to gather data concerning historic land management practices, with particular emphasis on the TEK of E.B.C.I. Data collected from the interview will consist of words and statements provided by the interviewee, which will be used to draw

conclusions. In addition, the process of how and where the data will be used was explained, which is to utilize the transcripts and notes from interviews in future publications and presentations.

Prior to each interview we prepared a step-by-step description of the interview procedure so every participant would have a hard copy to refer to if the participants had additional questions. We carefully explained the informed consent procedure/demographic information, and we made sure they thoroughly understood the interview procedure and answered any questions they had. Interview schedules were arranged at the participant's convenience including interview location, determined length of initial interview, and determination of whether audio tape recordings were acceptable. At the beginning of the first interview, we reviewed the purpose of the research study and qualitative interview protocol. The protocol relies on open-ended questions to elicit rich, detailed narratives of the participant's experience and knowledge. Additional prompts often clarified and expanded information that the participant offered. At the end of each interview, we determined whether further interviews were needed by evaluating interview notes and whether all questions were answered to our satisfaction. Future interviews were scheduled at the convenience of the participants.

In future publications and presentations, every participant and community will be assigned a pseudonym for protection unless the participant gives their permission to use their real names. All raw data such as demographic information of participants, audiotapes, and any other identifying information will be stored in a locked file in the ERI faculty sponsor's office for a period of three years. Any additional changes in

procedures in the protocol will be submitted to the IRB for written approval prior to changes being put into practice.

Data Analysis

We identified emerging themes and patterns by analyzing historical, ecological, and anthropological records using deductive quantitative methods, putting articles with similar theories, and comparing to see whether they correlated with and carried out deductive analysis of archival fire history of the region. Articles with opposing themes to Native American land management practices were put in one pile, and those in agreement of Native American influence on the Southeastern landscape were put in another pile. Each piece of literature was placed into one of the following four categories: (1) widespread and frequent burning of forests, (2) agricultural burning, (3) accidental or lightening caused fires, and (4) deliberately set fires. After we classified each piece of literature, we found two major themes. At Hunter Library at WNC, we found the microfilms contained United States Army land survey records from the mid-1800s. The army survey records were difficult to analyze because the records were hand written and not transcribed from their original state. Fire records/plans were scanned for time, date, severity, location (latitude and longitude), and size of past and recent forest fires. The fire records were difficult to analyze because there were no records kept prior to 1960. Public land records were evaluated for time and date of development in the forests.

We transcribed each of the qualitative interviews from the audio recorder. Then we conducted inductive analysis of the interviews for any correlating stores that might have been passed down from the participants' traditional knowledge of historic land management practices. Preliminary analysis of the qualitative interviews revealed

several emerging themes about the fire history of the Southeastern Cherokee's native land. The preliminary themes will be considered with further data that will be collected during interviews in the summer of 2002.

Data Presentation

Archival fire history of the Southeastern region exposed conflicting ideas among historians, archaeologists, forest service, or researchers from various agencies. We found that there is lack of accurate and available evidence of the extent of influence the Cherokee had on shaping the landscape before the arrival of European settlers, and specifically Cherokee burning methods. In reviewing the literature, we found seven authors who supported the concept that the Cherokee in the southeastern region used fire for significant economic reasons. For example, Goodwin (1977), Day (1953), and Pyne (1983) discussed how Native Americans burned to clear the forests of undesirable fuel accumulation, infestation of threatening insects, and to make tools, shelter and clothing. Then we found three authors who implied there was not enough direct evidence to support the claim that Native Americans had any influence on the landscape, specifically burning. For instance, Delcourt and Delcourt (1997) state that Native American burning may have had some influence on the eastern forest region but there is no "published studies [that] have been documented" (p 1010) that Native American use of fire had any effect on the current conditions of the southeastern vegetation.

The qualitative interviews that were conducted revealed two preliminary themes. The first theme we found was that fire was an intricate part of Cherokee land management practices, and the Southeast landscape was burned annually. Jerry Wolf, a Cherokee elder in his late sixties, was born and raised in the township of Big Cove, which

is one of the communities in the Cherokee Nation. Jerry is one of the elders who possess traditional knowledge passed down from his elders and was willing to sit down with us for an interview. We posed two questions to him, “What did [the Cherokee people] burn and when did they burn?” which revealed the first theme.

> “The whole, all the mountains. The fire didn’t get big in those days when they burned they were seasoned, annually because fire has taken care of all the, you know, the debris that would, that’d been piled up. You know, whereas if ah, you left, if you don’t burn then it begins to accumulate and you have a lot of grass and a lot of leaves and you know, it’s piled up and you when you burn lets say four years later, you burn and you have a gigantic fire cause you have a lot to burn and you could, it gets big and its destructive. It’s more destructive than it is ah, you know, to preserve. Whereas if you burn it every year then you know, you’re preserving the forest. And you got better timber, too, when you burn, cause it burns it, it again all the worms, insects that would destroy it.”

Jerry also mentioned that his “Grandpas’ used fire to burn all the trashy forest such as twigs and branches; they would annually burn the forest floor” and that “waiting 3-4 years would create an accumulation of forest floor litter, which would create a big fire.”

Marie Junaluska, a Cherokee tribal council member and expert on local food and medicinal plants is a well-known community member who was born and raised in Cherokee. Instead of using the term "managing" the land she stated that her family took care of the land:

> "[From] what I remember you know growing up, in taking care of the land…[if] my parents were going to do a garden they would clear a spot. The area that they had cleared, which wouldn't be too big, they would then burn it. Close to the ground, to get rid of the old cut [and they burned every] spring.

Finally, we discovered the second theme when we asked if fire should be reintroduced as part of contemporary land management practices because it would be beneficial to the landscape and would the Cherokee people be accepting. Marie's answer was:

> "I think the older people would be [accepting] because they understand. They used it. And thinking about [that] there is trees that are being eaten by some kind of a worm, a kind of bug, I think. And it's killing these pine trees. But I think when they use the fire they burn the underbrush, you know, that kills the insects. (And it kills trees too). And I think that would help today if we did that. But my Mom says we can't hardly do that now because the leaves are so thick."

These are preliminary themes that were gathered from the qualitative interviews conducted in summer of 2001 and more themes shall be gathered from interviews in the summer of 2002.

Discussion

The use of traditional ecological knowledge is important in understanding the current conditions of the southeastern forests. We have found literatures that acknowledge Native American use of fire for the purpose of the tribe's subsistence and their economy. Most of the literature we found discussed how the Cherokee may have used fire to take care of their land. There is lack of literature that describes the burning methods the Cherokee used to take care of their land. The literature we found stated there are no documents that have been published directly that says the Cherokee used fire to modify the landscape. A majority of the historical documents described the changes in Cherokee lifestyle after European settlement.

The qualitative interview data revealed preliminary themes that may be significant in understanding what the Cherokee know about past land management practices. The preliminary themes also revealed that there is ecological knowledge embedded in the Cherokee elders' traditional knowledge, which may have been passed down from their elders. Finally, the quantitative interviews show the significance of oral knowledge that the Cherokee elders and tribal members possess, and it is important as researchers, scientists, and land managers to take the opportunity to document the oral knowledge. The oral knowledge that the Cherokee people possess can help answer questions about current conditions of southeastern forests. Identifying Cherokee traditional ecological knowledge is significant in understanding current conditions of Southeastern forests, and land mangers can appropriately include traditional methods for contemporary restoration plans and treatments.

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